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ABSTRACT

This paper presents a holistic conceptualization of the school as an autonomous system. Two major scientific paradigms, reductionism and holism, are outlined and their impacts on educational administration are discussed. Findings of a study that investigated the participation of the governing bodies of independent schools in the schools' self-renewing processes are presented to illustrate the holistic approach to educational administration. The sample included five independent schools in the Anglican Diocese of Sydney. Results indicate that the governing body participates reflexively as well as directly--an adaptation that allows the school's self-renewing processes to function. However, to place the two paradigms of reductionism and holism in opposition is to create a false dichotomy. Administrators must recognize when it is appropriate to operate within one paradigm or the other. Differences exist in how school heads view their schools--as machines to be maintained or as something with lives of their own. (Contains 16 references.) (LMI)

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HEADS OF MECHANICAL OR LIVING SCHOOLS?
How We Attend To Our Daily Reality.

Paper Presented at
A.H.I.S.A.
1.10.1991

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It is a mistake to slit open the nightingale
to look for the song.
Emily Dickinson.

The new logic, then,
is that the earth is a single living system . . .
some kind of paradigm shift is in the process of occurring . . .
Hedley Beare (1991:27-28)

The new paradigm
emphasises the collective, cooperative and organizational
aspects of nature;
its perspective is synthetic and holistic
rather than analytic and reductionist.
Paul Davies (1989:3)

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Abstract

Have you ever tried to introduce a change into your school and found that, in spite of your best effort, what you have tried to change has either remained firmly in place or continued just beneath the surface? Have you ever felt that your school has a mind of its own, following its own agenda rather than the one you may wish to set for it? If these have been your experiences, then do not think them to be uncommon. Scholars

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studying organizational behaviour are beginning to discover that organizational order is something other than just the creation of management, and that institutions of all kinds seem to possess autonomous natures.

Within the last three decades, a way of attending to scientific phenomena has emerged which is significantly different from that which has guided scientific endeavour for the last three centuries. Holism has replaced reductionism: living systems have replaced machines. In spite of its having been hijacked by the "New Age Movement", the holistic paradigm has much to offer, not only to scientists, but also to educational administrators confronted with their autonomous schools. This paper attempts to present an holistic conceptualization of a school as an autonomous system, and, drawing upon recent research undertaken by the writer, which focussed upon the participation of the governing bodies of five anglican schools in N.S.W., illustrates how this different way of attending to our schools can help heads in coping with their schools' "independent" behaviour.

Introduction

At the conclusion of a public lecture on morphic fields by Dr Rupert Sheldrake held at the Australian Museum in December last year, an eminent scientist in the audience said (publicly) that he felt he had been listening to a supersalesman from the American West selling snake oil. Now I hope that at the conclusion of this paper, I don't elicit a similar response -- I fear, however, that I may. The fact is, that increasingly, scientists are working under one of two paradigms: the one most

commonly used has been around for some three centuries; the interloper has emerged only in the last three decades. Unfortunately, scientists working within the older paradigm seem to view science conducted within the new as somewhat suspect to say the least. Now Rupert Sheldrake may not be regarded by some as working in the mainstream of science, nevertheless there are very eminent scientists, such as Paul Davies, now professor of Physics at the University of Adelaide, who are regarded as mainstream and who espouse the new paradigm.

It is my purpose briefly to explore this newer paradigm from the perspective of educational administration, and to argue that, far from being dismissed as fanciful, this paradigm has much to offer educational administrators, and that it is a most appropriate paradigm for contemporary society. First, I want to outline in very broad terms the two paradigms of science. Second, I want to suggest how these paradigms have impacted upon educational administration. Third, I want to describe a research project which used a conceptual framework developed within the newer paradigm. Finally, I want to ask the question "how do you conceptualise you school?" Do you see yourself as the chief engineer keeping the machine running in good order? Or do you see yourself as head of something that is alive? Something with a life of its own, displaying an autonomy which you may not always understand, but with which you must come to terms if you are to play your full role.

Australia has been in the grips of a very severe recession. So severe, in fact, that in one organization, the following sign appeared on a notice board: "Due to financial restraints, the light at the end of the tunnel will be turned off until further notice." My experience as head of an independent school has been that at the end of a day, I often feel as though

that light has been turned off and I wonder what I had been struggling with all the day. But there is hope, and I believe that the light returns when we understand the nature of our schools and can see them for what they are -- living systems with a deep concern for their autonomy.

Before embarking, a word of definition is necessary. The word "paradigm" means different things to different people, and, according to Morgan (1980:606), it means at least twenty one different things to the person who made the concept popular in the 1960s -- Thomas Kuhn! Following Morgan's (1980:606) lead, I propose to use the word "paradigm" in its "metatheoretical or philosophical sense to denote an implicit or explicit view of reality." Within these metatheoretical constructs there will be different ways of approaching and studying the shared reality. I propose calling such approaches "conceptual frameworks". These are then operationalized at a third level, that of "problem solving".

1. The Two Paradigms In Outline

According to the older paradigm, the traditional, mechanistic paradigm derived from Newtonian physics, the world is seen as a machine made up of component parts. These parts can be isolated and studied in detail, even reduced to still smaller parts so that when these basic, simple parts are fully understood, then one can understand how the whole fits together and operates. In this sense it is reductionist: always trying to reduce phenomena into more fundamental, less-complex parts which, it is hoped, will contain the ultimate clues as to why the more complex congregations of those parts are as they are. There is an

emphasis upon "structure" in the sense of how the parts fit together, upon equilibrium and homeostasis. By good "engineering", future states of the "machine" can be predicted and controlled. As Sheldrake states: nature in this paradigm is the inanimate "World Machine, and God the all-powerful Engineer" (Sheldrake, 1990:12). In our context, the school is the machine, and the head the "chief engineer".

According to the newer paradigm, the world is best considered as a living, holistic system. It is an indivisible whole which is something *more* than just the sum of the parts. It can, for the sake of analysis, profitably be broken into parts but they too must be seen as wholes so that, like Chinese Boxes, there are wholes within wholes. Unlike machines, which are closed systems, living systems must be open to their environments with which they are in disequilibrium in order to ensure necessary energy and matter exchanges. Their structures are dynamic, and concerned with *process* rather than static configuration. Such systems deal with their openness self-referentially, that is, in terms of what is meaningful to them. They possess an autonomy. Controlling and predicting future states of such complex, dynamic systems is highly problematic if not impossible.

Immediately one is confronted with one of the suspect characteristics of the newer paradigm, for surely, the possibility of prediction and, more importantly, the *control* of the future which such prediction implies, is what makes science and technology within the old paradigm so attractive and useful. So why argue for a paradigm which does not offer one of the most attractive features of the alternative? Hopefully that question will be answered to some extent, in the course of this discussion.

2. Educational Administration And The Paradigms Of Science.

But what has a conflict of scientific paradigms to do with educational administration? Many practising administrators, and, unfortunately, many scholars, would probably respond by saying "very little". It is my contention, however, that this ought not to be the case and, on the contrary, it ought to be of central significance to its discourse. Like pure science, educational administration, along with more general theories of administration, has developed largely within the mechanistic, reductionist paradigm. Educational administrators spend much time and effort developing conceptual frameworks which attempt to provide knowledge and understanding of the component parts of their "mechanistic" organizations in the hope that such knowledge and understanding will help them in their administration of their enterprises. It is questionable, however, the extent to which this hope has been realized.

The evidence to support such a claim, I suggest, is not difficult to find. If the theory produced within the mechanistic paradigm is totally adequate, then the problems confronted by educational administrators day-by-day should easily be solved by the mere application of that theory. Even the language we use supports this hope. How often, to take one common example, do we see the problems in our schools as the result of a "breakdown of communications". Now using the term "breakdown" straightway links us to cars and machinery. It implies that something mechanical has gone wrong. "Something an expert can tinker with --

knowing exactly where to put his or her spanner -- and get back on the road again" (Cozens, 1988:4).

Further, a knowledge of the present state of the component parts of the enterprise being administered should, by proper application of theory, lead to predictions of future states. Decision alternatives should be able to be tested within a theoretical model, and the alternative which predicts the most desirable state is the one the administrator should choose. *Why, then, do administrators make so many poor choices?* Choices that don't achieve the desired results, or even worse, lead to undesirable outcomes. Do they not know, or not apply, the theory correctly? I think that is unlikely, as never before in the history of education has there been so many highly credentialed educational administrators making these choices!

Hills and Gibson (1990:31) have probably hit the mark with their claim that there is an "absence of a scientifically reliable technology on which to base technically rational problem solving, and . . . [an] improbability of there being such a technology within the foreseeable future, *if ever*" (emphasis added). If ever!

The problem is that the mechanistic paradigm which has produced the theory available to solve the problems in our educational institutions, is not able to cope with the ever-increasing complexity of society. As the theory of chaos demonstrates, for complex, dynamic systems, the development of models that will be able to predict and control the future, is a vain hope. A new paradigm is needed: a paradigm that will enable the development of conceptual frameworks and problem

solving techniques able to cope with an open and unpredictable future -- a paradigm that can cope with complexity and its attendant contingency.

Davies (1989:21) claims that modern science affirms that "the universe began in featureless simplicity, and grows ever more elaborate with time", and that "there exists something like a law of increasing complexity." But complexity presents the administrator with an overwhelming range of choices. What are needed are theories which will enable the administrator to live with this complexity without being overwhelmed by it: theories which are able to preserve the richness of the complexity and its increased possibilities, while at the same time making it tolerable -- complexity *reduced*, not complexity *eliminated*. (*Note*: The word "reduced" is not here used in the reductionist sense of seeking something more fundamental, but rather in the sense of lessening a burden so that it becomes tolerable.) But to achieve this, we must first concede that there is an alternate to the reductionist view with its claim that the real world is nothing but the aggregation of its fundamental parts -- an alternative to the "nothing buttery" approach as Davies (1984) calls it.

3. The Outline Of A Conceptual Framework In The Newer Paradigm.

What, then, do conceptual frameworks look like within this newer paradigm which is able to cope with this increased complexity in the world of educational administration? That is too large a question for me to deal with, so rather, let me outline for you one such conceptual framework which has been proposed by Sungaila (1988(a), 1988(b),

1989, 1990) along the lines of the German sociologist, Niklas Luhmann, and adapted by myself. In this framework, a school is conceived of as a social system which may be described and analysed at two levels; at the concrete level of the individuals who comprise the school at any instant in time (the pupils, the staff, the administrators, the governors, the parents, etc.); and at the abstract level of their meaningful communications. Now these two levels of description are not to be regarded as two separate entities as is seen in the dualism of Descartes which regards human beings as composed of two distinct, separate kinds of things -- bodies and minds. Rather they must be seen as being two levels of description of the whole, analogous to the hardware and the software of computer systems. At the hardware level there are the individuals; at the software level there are their meaningful communications. Just as the computer boffin takes for granted that there is no incompatibility between the causal connections at the two levels and, in the one breath, speaks of the electrical circuitry obeying laws of electricity, and of the computer solving equations and making decisions, so it is possible to live with the different levels of description in social space without having to grapple with their causal connections (Davies, 1984:79-86).

3.1. Complexity, Choice, and Contingency.

In our every day lives, the choices available to us increase more and more as our environments become more and more complex. Schools are increasing in complexity, not only as a result of the increases in complexity of technology, but also as a result of the increase in complexity of the society in which our schools exist. For our forebears, for example, the contemporary choices of single parent families, or even

homosexual families, were not choices at all; basically there was only one institutionalized family unit, and it consisted of monogamous, heterosexual parents and their children (biological or adopted). Single parent families only occurred as a result of misfortune, and, if not the result of the death of a spouse, were often relegated to the fringes of society; and families centred around a homosexual couple were not even within the horizon of possibilities! Yet both possibilities are now available in society -- there is no social stigma for those who choose to separate from a marriage relationship or who even choose to have children without entering such a relationship either by means of extramarital coitus or even bio-technology; and homosexual couples, while biologically still unable to produce children or legally to adopt children, can nevertheless form families where one or other of the partners has a biological link to the children. And the children from these families attend our schools. So the available choices increase within society and schools must become more complex in order to deal with the increased complexity of their environments.

Increased complexity, however, also brings with it increased contingency as the choices I make and communicate to others, could always have been otherwise than those selected. And social space contains other people so in any social interaction, where ego relates to alter, ego cannot assume that alter is a puppet merely waiting to accept ego's choices as the basis for his or her own future action. On the contrary, alter is as free as ego to make his or her own choices, so there is a double contingency with alter's choices contingent upon the contingent choices of ego. How does a school deal with this social problem? According to Luhmann, our choices are guided by structures of expectations which are generalized from social interactions and which

are more or less disappointment-free. In our daily lives we come to expect certain things -- such as that night follows day, that our children will grow up, that the welfare state will look after us in times of need -- and we use these expectations, which are more or less disappointment-free (the welfare state can run out of funds; but I am not aware of the sun not rising!) to guide our choosing. In social life, however, because of double contingency, our choices are not guided by such simple structures of expectations, but rather by structures of expectations of expectations. A pupil cannot expect that her teacher will automatically teach her, all she can expect is that her teacher *expects* to teach her. It is the teacher's *expectation* that is expectable, not her actual behaviour (as compared with the physical world).

So it is structures of expectations of expectations which reduce the complexity of social systems (without eliminating the richness of its increased possibilities) and thus enable the systems to function. In other words, within these structures, I am walking with reasonable confidence, along well-trodden ground as it were. And it is these structures of expectations of expectations which allow a social system to function and maintain its identity, that is, to be self-renewing, so that in spite of the comings and goings of a school's personnel and its openness to its environment, its identity remains in tact.

Now "structure" in this paradigm, remember, does not refer to static configurations. Rather "structure" refers to how the system operates -- it is something dynamic: it is "process structure" (Davies, 1989:83). It is the structure of language, for example, which enables individuals to engage in rapid, fluent, meaningful speech (Luhmann, 1985:32). So too the structures of expectations of expectations enable a

school to function. For self-renewal to occur, however, and the school to maintain its identity, these structures must be kept stable within what are assumed to be the three dimensions of social reality -- the temporal dimension (i.e., over time), the socio-political dimension (i.e., among the social group), and the material dimension (i.e., contexts of meaning within which expectations can be identified and stored)[1].

3.2. The Temporal Dimension

When the expectations of expectations which structure the daily life of a school are disappointed by the choice of a member of the school population, that is, when the choice is communicated and presents itself unexpectedly, then the future stability of the expectation is threatened: Was the disappointment merely a slip on the well-trodden path, or is the path itself no longer viable? In other words: Can the disappointed expectation of expectation continue to be held? Or do new expectations of expectations which have a greater probability of being disappointment-free, have to be learnt? If the school is to maintain its identity in the future, then disappointment must be dealt with.

There are two ways in which disappointment is handled -- we can adapt the expectation to correspond to the disappointing reality, that

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[1] The reader may protest at the arbitrary introduction of *three* dimensions of social reality. While a detailed justification is beyond the scope of this article, the argument would rely on the facts that social interaction occurs in **time** and evolves (the temporal dimension), it is **subjects** who interact (the socio-political dimension), and the interaction is about **objects** which can be identified within differentiated meaningful contexts (the material dimension): in other words, people relate *socially* in *time* and about *things*.

is, we can learn from the experience. Or we can continue to hold the expectation contrary to the facts as they present themselves, but we must then be able to explain the disappointing reality.

Many of the expectations that structure a school's daily life, are of the latter kind, and must be maintained in spite of any disappointment. This means that mechanisms must be available which will enable disappointment to be dealt with so that the disappointed expectations can be preserved for the future. Within the school's "culture" there are a number of devices that enable disappointment to be handled. It can be explained away in terms of some myth (or saving story, or stereotype) -- the pupil failed to learn mathematics because she was a girl; it can be dealt with by some ritual (or ceremony) -- the teacher was "carpeted"; or redress can be taken by means of some sanction -- the pupil was suspended. By such means, the disappointment is shown for what it is, and the disappointed expectation of expectation can continue to be held.

3.3. The Socio-Political Dimension

The structures of expectations of expectations are stabilized among the school population by means of institutionalization. In the particular conceptual framework I am describing, institutionalization has a quite specific meaning and expectations are institutionalized when they are the expectations presumed to be held by unidentifiable third parties within the system, that is, when there is a presumption of consensus concerning those expectations -- these are the expectations that "everyone" (whoever the unidentifiable "everyone" may be) agrees upon.

To maintain the presumption of consensus, the agreed upon expectations need to be communicated among the school. Language is one means of communication, but in situations of increased complexity, there are other more generalized means of communication which have greater chances of success in ensuring that more complex communications are received. Among a social group, and especially one in which there may be conflict and that is essentially political in nature, *power* is such a generalized medium of communication. So power will be used to maintain the presumption of consensus. The head of a school is a power-holder, and he or she has a number of power sources available to heighten the probability of successfully communicating the presumed consensus. For example, the head's special relationship to the school council is empowering when communicating with staff.

Further, within a school there are people and groups who make decisions, who set policies, and make plans which are binding upon the school. Such policies, plans and decisions need *legitimacy* and this is achieved by the use of two complementary processes -- symbolically generalized physical force by which the power-holder is able to ensure that decisions, plans, and policies are accepted; and the participation in institutionalized procedures which prevent the symbolically generalized physical force from being used tyrannically. The position of the school council as the super-ordinate unit at the top of the hierarchy endows it with symbolically generalized superior physical force, but its formal meeting procedures, requiring a quorum and matters to be dealt with on a formal agenda, guarantee that such force cannot be used arbitrarily.

3.4. The Material Dimension

The structures of expectations of expectations are identified, stored and made accessible within the school in various factual meaning contexts -- in persons, in roles, in programs and in values. In this way they are stabilized at varying levels of abstraction and with varying levels of security within the material dimension.

At the most concrete level (and the least secure level) expectations are identified and stored in persons. Obviously, this method of identifying and storing expectations is more suited to small, intimate situations, or where the person is very visible. The charismatic heads of the past were the store-houses for their schools expectations. Identification and storage in persons involves high risk, however, in that a person can change or disappoint in some particular, and all the expectations stored in that person becomes threatened.

At the next level of abstraction, expectations are identified and stored in roles which are really limited bundles of expectations not attached to particular people but are assumed by various and changeable role performers. This is more general in that the expectations are stored in the role itself and not in the person performing it; however, the latter still represents a risk to their security.

Programs are verbally fixed rules which define correct action. Not being attached to particular persons or particular roles, there is a greater level of abstraction, and a greater level of security. As complexity increases, so schools are storing more and more expectations

in verbally fixed forms -- in handbooks, in aims and philosophies documents, in memoranda, in curriculum documents etc, all of which are programs of one sort or another.

Values are the most abstract level at which expectations are identified and stored. It is the most secure level as values are not subject to the whims of a person, or the different ways a role can be performed by differing people, or even to changes made in a program. Their abstraction, however, makes them difficult to identify in the first place, and their generality leaves open many possible actions. For example, schools value learning, but that still leaves open the types of actions which will advance learning.

While these four contexts for the identification and storage of expectations are differentiable, in the normal course of events one does not consciously determine from which context an expectation of expectation is being accessed. Further, the various levels presuppose and determine one another reciprocally: roles presume that there are people to perform them; and people are relieved of individual responsibility by performing roles, for example.

3.5 Summary

Here then, is the outline of a conceptualization of a school as a self-referential system which is able to maintain its identity by processes of self-renewal. These involve structures of expectations of expectations which are stabilized temporally by means of handling disappointment; socio-politically by maintaining a presumption of consensus; and

materially by identification and storage in persons, roles, programs, and values.

But the school as a self-renewing system is not the whole story, because schools also change and evolve in response to increased environmental complexity and contingency. This is achieved by processes of self-organization. Although normatively closed to their environments so that all choices that a school makes are made self-referentially, a school is nevertheless necessarily open to its environments with which it must make exchanges and with which, as a consequence, it will be in disequilibrium. This means that a school will be subject to disturbances or fluctuations -- disappointment and dissent will occur. For the most part this will be dealt with by the school's self-renewing mechanisms as outlined above and the school will dampen the disturbance and continue unchanged. Some fluctuations will be such, however, that they will be amplified within the school to a point where its self-renewing (autopoietic) mechanisms will be overcome and a new regime instituted -- this is the school's self-organizing mechanism. The Nobel Prize winner, Ilya Prigogine, states that "order through fluctuations" is a fundamental organizing principle in nature (Prigogine, 1976). In brief, this involves processes (autocatalysis) whereby, by means of a leader (hopefully the head) who recognises the seed of a change, becomes committed to it, is prepared to challenge the presumed consensus, and can provide a vector of vision, a fluctuation can be amplified and new structures institutionalized.

4. The Research Project

The particular research project that I have been involved with, and which used the conceptual framework just described, was to investigate the participation of the governing body of an independent school in the school's self-renewing processes which guarantee the continuity of the school's identity. In particular, I investigated this phenomenon at my own school and then looked more briefly at the same phenomenon at four other A.H.I.S.A. schools in the Anglican Diocese of Sydney. From this study I have concluded that the governing bodies of independent schools play significant roles in their schools' self-renewal. In particular:

> *The governing body ensures that disappointment is handled -- usually by the head -- and it provides means by which this can happen. In particular, it sanctions the head. In this manner it ensures that the schools structures of expectations of expectations are stabilized temporally.
>
> *The governing body ensures that dissension is kept at bay by powerfully communicating the school's presumption of consensus concerning the expectations of expectations and thus keeping them stable socio-politically. Further, it is itself an identifiable "third party" within the school and it is its legitimate expectations of expectations that others in the schools must expect.

*The governing body identifies and stores expectations in persons, in roles, in programs, and in values within the school. In this way they ensure that the structures of expectations of expectations are materially stable. The governing body selects the person in the role of head, and largely defines that role and other senior roles, it approves the school's programs, and sustains its values.

From the above, it can be seen that the governing body not only participates directly, but more significantly, it participates *reflexively* . Now the notion of reflexivity simply means applying something to itself, and the reason for doing this is to heighten its effectiveness to achieve its main function in the face of complexity. By way of illustration, in simple societies, or in situations of relatively low complexity and contingency, teaching can take place as problems arise and need to be solved -- "on the job" as it were. When complexity and contingency increase, however, teaching is guaranteed greater effectiveness if it functions at the reflexive level, that is, if we first "teach teaching before teaching the children" (Luhmann, 1976:524). Now this rule of reflexivity applies generally, according to Luhmann (see for example 1985:164-165), so that in situations of increased complexity and contingency, something always functions more effectively if it has first been applied to itself, that is, if it is available at the reflexive level.

It is my claim that the governing body of an independent school is an adaptation which enables the school's self-renewing processes to function at the reflexive level -- it sanctions the sanctions in the temporal dimension, it institutionalizes the institutions in the socio-political

dimension, and it makes accessible the means of making accessible expectations in the material dimension.

The conceptual framework that I have described and which was developed within the holistic, dynamic paradigm, has been most helpful in enabling me to attend afresh to the participation of an independent school's governing body in the life of the school, and to generate knowledge that can assist me confront the problems I encounter in my daily reality as a school administrator and the executive officer of such a body.

4. Is It A Case Of Only Either The Old Or The New?

Although my thesis has been that the traditional paradigm used by scientists (including social scientists) is under challenge from the newer paradigm and one seems to be espoused to the exclusion of the other, the older paradigm is not to be despised, and it would not be my intention to argue for its abandonment, for it is this older paradigm which has successfully guided science for the past three hundred years, and has produced the technology so much a part of the modern world. As Sheldrake (1990:xiii) himself says: "The mechanistic approach has provided us with technological and industrial progress; . . ." But it is the very complexity of the modern world (including its technology which has been produced by the mechanists), with which the mechanistic paradigm cannot deal. It is an irony that the mechanists have themselves, to a large extent, highlighted the need for another paradigm!

Being one who looks to Holy Writ for my rule of life, I am reminded that God confirmed His covenant with Noah by means of a rainbow; and Jacob's special gift to Joseph was a coat of many colours. I am therefore attracted to the notion of Jelinek *et al* (1983) who argue against "monochromatic thinking" in favour of an "interpretive framework more like a rainbow -- a 'code of many colors' that tolerates alternative assumptions." Hofstadter (quoted in Davies, 1984:63) makes a significant point, I believe, when he denounces as invalid any dichotomy that the world is understood *either* by holism *or* by reductionism. In his view, both are legitimate ways of seeking knowledge, depending upon what you want to know.

Hills & Gibson (1990:32), illustrate my point well at the level of conceptual frameworks, when they state:

> Metaphorically speaking, it is useful to view such frameworks as arrangements similar to those used in encyclopedias to portray the complexity of the human body with a succession of transparent overlays representing abstracted subsystems, i.e., the skeletal, circulatory, nervous, digestive, etc. Alternatively, one may think of them as a succession of maps representing topological, hydrological, botanical, geological, zoological and other features of the same terrain

In this paper I have sketched for you the two major paradigms within which contemporary science is being conducted. I have indicated how these impact upon educational administration and given a fairly detailed illustration of a conceptual framework and research problem in the newer paradigm. The heading of the paper is "Heads of Mechanical or Living Schools ?" The implication is that we see ourselves as either one or the other, but I have just indicated that to place the two paradigms of reductionism and holism in opposition is really to create a false

dichotomy. I have already confessed my position vis-a-vis Holy Writ, I want finally to confess my position as a chaoticist: I am very attracted to the theory of chaos and one of the fascinating concepts in that theory is that of fractals which, from one point-of-view, may briefly be described as figures which maintain their appearance in spite of their scale. For example, take a section of a coastline and draw a map using a scale of, say, 1:100. Take a section of that chosen section and draw it on a scale of 1:20. Again, take a section of that section and draw it on a scale of 1:4. Each of the maps will look similar. Coastlines are fractals. (In fact the length of a coastline is entirely dependent upon the scale used to measure it and all coastlines approach infinite length be it the whole Australian coastline or just the coastline of Tasmania.) The point I want to make is that in fractals, *the whole is reflected in the parts, and the parts are reflected in the whole.* The concept of an atom with its nucleus surrounded by electrons is similar to that of a solar system with a sun surrounded by planets, which itself is not dissimilar to that of a galaxy with its core surrounded by solar systems! This solar system concept seems ubiquitous within the cosmos, irrespective of scale. Is it too fanciful to suggest that perhaps here, in the concept of fractals, lies a clue to the synthesis of these two paradigms?

Heads of mechanical or living schools? Well, while I obviously believe the latter, I also believe the former -- the clue is to recognise when it is appropriate to operate within the one or the other.

References Cited:

Beare, H.
1991 "The Gulf War And The Cosmos; Who Won?" *Eremos*. Magazine of the Eremos Institute, No 35, Winter 91

Bell, J., Bush, T., Fox, A., Goodey, J., & Goulding, S. (Eds)
1984 *Conducting Small-Scale Investigations in Educational Management*. Harper & Row, Publishers in association with The Open University, London.

Cozens,J.
1988 *Nervous Breakdown*. Judy Piatkus (publishers) Ltd, London

Davies, Paul
1984 *God and the New Physics*. Pelican Books. Penguin Books Ltd., Hammondsworth, Middlesex, England.

1989 *The Cosmic Blueprint: New Discoveries in Nature's Creative Ability to Order the Universe*. A touchstone Book. Published by Simon and Schuster Inc, New York, London, Toronto, Sydney, Tokyo.

Hills, R.J.
1982 "Functional Requirements and the Theory of Action". *Educational Administration Quarterly*, 18(4):36-61.

Jantsch, E., & Waddington, C.H.
1976 *Evolution and Consciousness: Human Systems in Transition*.

Jelinek, M., Smircich, L., & Hirsch, P.
1983 "Introduction: A Code of Many Colors", *Administrative Science Quarterly*. 28( ):331-338.

Luhmann, N.
1985 *A Sociological Theory of Law*. Routledge & Kegan Paul, London.

Morgan, G.
1980 "Paradigms, Metaphors, and Puzzle Solving in Organization Theory" *Administrative Science Quarterly*, 24(4):605-622

Prigogine, I.
1976 "Order through Fluctuations: Self-Organization and Social Systems." In Jantsch & Waddington, 1976.

Sheldrake, R.
1990 *The Rebirth of Nature*. Century: London Sydney Auckland Johannesburg

Sungaila, H.M.
1988(a) "Towards a Synthesis of Contemporary Research in Educational Administration." Paper presented at AARE Conference, 1988 (unpublished).

1988(b) "Conceptualizing and Operationalizing the Study of Policy Impact". Paper presented at AARE Conference, 1988 (unpublished).

1989(a) "The New Science of Chaos: Making a New Science of Leadership?" A paper presented to A.C.E.A. Conference, September, 1989.

1990 "Organizations Alive! Have We at Last Found the Key to a Science of Educational Administration?" *Studies in Educational Administration*, 52, May 1990. Commonwealth Council for Educational Administration. Armidale, N.S.W.

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